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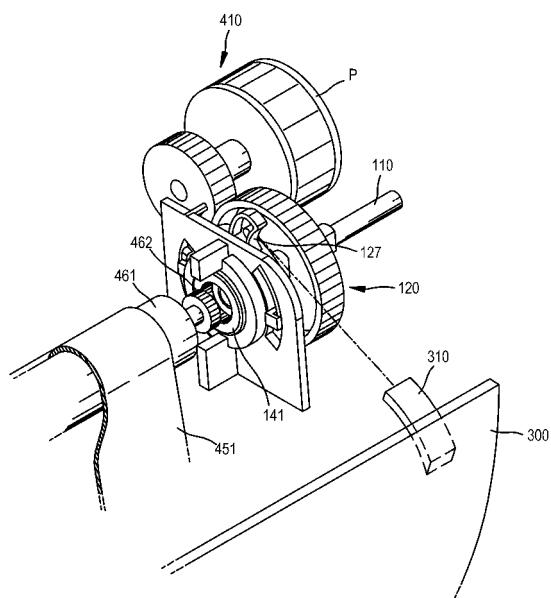
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(54) Coupling apparatus and image forming apparatus employing the same

(57) An image forming apparatus includes a main body unit (410) which has an image forming unit (430); a door unit (300) which couples with the main body unit (410) to open and close the main body unit (410), and has a projection (310) at one side thereof; a mid-transfer unit (450) which couples with the door unit (300); a coupling knob (120) which is provided in the main body unit (410) and rotates in cooperation with pressure of the projection (310) when the door unit (300) is closed; and a coupling apparatus which is provided in the main body and transmits a driving force from the main body unit (410) to the mid-transfer unit (450) in cooperation with the rotation of the coupling knob (120).

FIG. 7





EUROPEAN SEARCH REPORT

Application Number
EP 07 12 2167

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (IPC)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
X	JP 2003 280489 A (CANON KK) 2 October 2003 (2003-10-02)	1-3	INV. G03G21/16
Y	* abstract; figures 1-7 * * paragraph [0021] - paragraph [0029] * -----	4-16	
Y	JP 09 114164 A (CANON KK) 2 May 1997 (1997-05-02) * abstract; figures 2-9 * * paragraph [0072] - paragraph [0077] * -----	4-16	
A	US 2006/104662 A1 (KAWASUMI RYOICHI [JP]) 18 May 2006 (2006-05-18) * paragraph [0040] - paragraph [0050]; figures 3, 4 *	1-16	
A	JP 2002 149037 A (BROTHER IND LTD) 22 May 2002 (2002-05-22) * abstract; figures 3-11 * * paragraph [0053] - paragraph [0081] * -----	1-16	
A	US 2006/239716 A1 (KIM SUNG-DAE [KR] ET AL) 26 October 2006 (2006-10-26) * paragraph [0044] - paragraph [0054]; figures 2-9 *	1-16	TECHNICAL FIELDS SEARCHED (IPC)
			G03G B41J
The present search report has been drawn up for all claims			
2	Place of search Munich	Date of completion of the search 4 November 2010	Examiner Billmann, Frank
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			



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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
- Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

1-16

The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC)



LACK OF UNITY OF INVENTION
SHEET B

Application Number
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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-16

Image forming apparatus comprising a door having a projection to open and close a main body, a coupling knob rotating in cooperation with pressure of the projection when the door is closed to transmit a driving force from the main body to a mid-transfer unit.

The technical problem to be solved by these features is to improve a drive transmission to a mid-transfer unit of an image forming apparatus.

2. claim: 17

Coupling apparatus comprising a rotatable shaft installed in a frame; a coupling knob rotatably coupled to the frame and arranged to rotate coaxially with and independently of the shaft by an external force; a coupling link coupled to the frame movably in the axial direction of the shaft according to the rotation of the coupling knob; a coupling unit coupled to the shaft arranged to rotate along with the shaft and to move between a coupling position and a decoupling position in the axial direction of the shaft according to the movement of the coupling link, to couple a component to a driving unit; and an elastic member installed around the shaft to elastically bias the coupling unit to the decoupling position.

The technical problem to be solved by these features is to improve a coupling mechanism for coupling a component to a driving unit.

ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

EP 07 12 2167

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on. The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

04-11-2010

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